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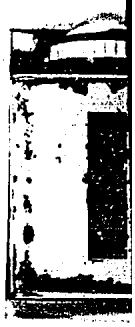

EFFECTIVENESS OF METAL PROPS IN USSR COAL MINES

Ugol', No 1
Moscow, Jan 1954

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The introduction of metal props at the extraction face in seams with a slight dip was started on an industrial scale in 1947, after the SGK-2 metal prop was designed.

The increase in the number of faces converted to metal props in recent years is characterized by data in the following table:

Mines	Number of Faces for Beginning of Year					
	1948	1949	1950	1951	1952	1 Oct 1953
Ministry of Coal Industry	25	165	377	498	525	586
Including Donbass	19	126	289	368	382	459
Karaganda	4	17	48	46	48	52

At the end of the third quarter 1953, according to data in the above table, 586 mines in the coal industry had been converted to metal props, or about 25 percent of faces [in slightly dipping seams] and, in the Donbass, 459 faces, or about 35 percent of the total number of faces in slightly dipping seams.

Metal props were used most extensively at mine faces in the Donbass (more than 78 percent of all faces with metal props); the Karaganda basin accounted for 10 percent and the Molotovugol', Chelyabinskugol', and Vostsibugol' combines, 12 percent.

For a clarification of the effectiveness of the use of metal props at extraction faces in the Donbass, 19 mines were selected, in these 80 percent of all working faces had been converted to this type of propping, and of these, all faces had been converted in ten mines. Data are given in the following table:

Combines	No of Mines	Average Daily Output of Mine (tons)	No of Faces		Metal Props in Use		Percent of Faces Supplied With Metal Props
			Total	No With Metal Props	Total (1,000)	Units per Face	
Stalinugol'	11	900	43	36	27.7	770	83.7
Voroshilovgradugol'	8	810	40	29	16.6	573	74.5[sic]
Total	19	860	83	65	44.3	680	79.5[sic]

These mines used 44,300 metal props, or about 28 percent of the entire number in use in the Donbass. Of the 65 faces converted to metal props, roof control was carried out by partial backfilling with rubble strips at 43 faces (66 percent) and by caving at 22 faces (34 percent).

The introduction of metal props brought about a saving in mine timbers in these mines. The consumption of timber at extraction faces dropped from 26.9 to 15.8 cubic meters per thousand tons of coal extracted, or 41.3 percent. At 18 mines, the consumption of mine timbers decreased, and at one mine, it remained without change.

Index	With Wooden Props	With Metal Props	Percent
Consumption of timbers per 1,000 tons extracted at the face (cubic meters)	26.9	15.8	58.7
Cost of propping, roof control, and timber delivery per ton of extraction from face. (rubles)	9.40	7.7	82.0
Including Material for props	4.25	3.62	85.0
Total wages for labor	5.15	4.08	80.0
Including Delivery of material	1.10	0.69	63.0
For propping	1.50	1.16	77.5
For roof control	2.55	2.23	87.5
Labor per 100 tons of daily extraction (man/shift)	12.9	9.45	73.5
Including Timber delivery	3.48	1.70	48.8

The costs of materials for propping decreased from 4.25 to 3.62 rubles per ton of extraction or 15 percent. The costs of materials decreased in 13 mines and increased in six.

The costs of wages for delivery of materials per ton of extraction dropped from 1.1 to 0.69 ruble, or 37 percent. At the same time, the laboriousness of this process per 100 tons of daily output decreased from 3.48 to 1.7 man/shifts, or became less than half its former figure. Out of 19 mines, wages for delivery of materials were decreased in 18.

The chief element determining the effectiveness of the use of metal props at extraction faces is the decrease in the consumption of mine timbers. As already has been indicated, consumption of timbers at extraction faces decreased from 26.9 to 15.8 cubic meters, or 11.1 cubic meters on the average per thousand tons of extraction, for 19 mines. This was achieved under the following conditions: Of 83 faces, 65 were converted to metal props, somewhat more than 75 percent, and these faces were 79.5 percent supplied with metal props. If all the faces should be converted to metal props and completely equipped with them, then the consumption of mine timbers per 1,000 tons of extraction would be decreased 16.7 cubic meters instead of 11.1 cubic meters; compared with the period of wooden props, the decrease would amount to more than 60 percent.

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Since the amount of the consumption of mine timbers varies for specific mines, ranging from 15 to 45 cubic meters per 1,000 tons of extraction, estimates on a decrease in their consumption are more correct if not based on absolute data but rather on the percent of decrease in the consumption of timbers as compared with the period of wooden propping. It is possible to see the dependence of the consumption of mine timbers on the degree to which the faces are equipped with metal props from the example of specific mines. The saving of mine timbers in the Mine imeni XVII Parts "yezd was 30 percent, where all the faces had metal props but were only 62.3 percent equipped with them; in other mines, where all faces were also propped and almost completely equipped with metal props, as, for example, Mine No 17-bis (94.5 percent), Mine No 3-bis (95 percent), Mine No 27 (95.5 percent), and Mine No 6 Krasnaya Zvezda (94.9 percent), the saving was 45-55 percent. On the other hand, in mines poorly supplied with metal props, such as Mine No 1-bis (27.1 percent) and Mine No 4-3-bis (59.8 percent), or in mines where not all faces were converted to metal props, the saving was only 5-15 percent.

The complete list of the 19 mines which were investigated in the procurement of the above data is as follows: from the Stalinugol' Combine -- Mine No 29 imeni Stalin, Novo Mushketovo, No 6 Krasnaya Zvezda, No 3 Butovka, Novo Mospino, No 3-bis, No 17-bis, No 20-20-bis, imeni XVII Parts "yezd, No 15 Osnovnaya, No 27; from the Voroshilovgradugol' Combine -- Churilino-Zapadnaya, No 1-bis, No 4-3-bis, No 3-5 Sokologorovka, No 5-5-bis, No 12-bis, No 4, and No 9 imeni Lenin.

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